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ORBIT AND PRELIMINARY PERTURBATIONS OF THE MINOR
PLANET (716) BERKELEY.
(ABSTRACT OF THESIS)

The asteroid (716) Berkeley was discovered July 30, 1911, by Palisa of Vienna and named "Berkeley" by him for the Students' Observatory of the University of California. The earliest determinations of its orbit revealed a mean motion very nearly commensurable with that of *Jupiter* in the ratio two to five. It therefore belongs to the class of minor planets which Brendel has designated as critical in so far as the mathematical theory of perturbations is concerned.

The planet offers an unusually interesting and fruitful problem in the theory of perturbations, since Hansen's method cannot be applied. The group theory as developed by Professor Bohlin of Stockholm was chosen as the basis for the development of the perturbations. During the development of the work, several important questions arose concerning the applicability of the Bohlin method when almost exact commensurability takes place.

In critical cases of this sort the success of the investigation depends very largely on the accuracy of the underlying osculating orbit.

The final test of any orbit is its representation of the observations. The writer investigated from that standpoint the various orbits of this asteroid which have been published, and compared their representations of the observations with those of several orbits computed by him by Leuschner's Short Method. It was found that the writer's orbit represented observations extending over a period of eight years better than those hitherto published.

Even on the basis of this osculating orbit, the most accurate obtainable, the final values of the constants of integration can be derived only after additional observations shall have been secured. For this reason, the perturbations derived by the writer have been termed "preliminary."

F. J. NEUBAUER.

NOTE ON COMET *b* 1916 (WOLF).

The first elements of the orbit of this comet, computed from observations of April 24, May 10, and May 23, 1916, and published in Lick Observatory Bulletin No. 282, represented the observations so well that it was not necessary to compute a